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JOSEPH PENNELL

AN EXHIBITION OF LITHOGRAPHS

MCMXVIII

CARNEGIE INSTITUTE
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LIBRARY

JOSEPH PENNELL

LITHOGRAPHS OF WAR WORK IN ENGLAND & AMERICA

JANUARY FOURTEENTH
FEBRUARY EIGHTEENTH

M C M X V I I I

DEPARTMENT OF FINE ARTS
CARNEGIE INSTITUTE

8. 8. 1918

VICTORIA AND ALBERT MUSEUM LIBRARY

JOSEPH PENNELL

MR. JOSEPH PENNELL, who has returned to this country after making his home abroad for many years, certainly needs no introduction to an American public. Cosmopolitan in his art, American in his ideals, no other contemporary artist has visited so many lands, and interpreted the individual character of cities and countries with so personal a charm. Whether with pen and ink, or brush; on etched plate, or lithographic stone, the artistic quality of his work is always notable.

The present exhibition, under the general title of War Work, includes two series, one made with the approval and cooperation of the United States Government, the other with the permission and authority of the British Government, both depicting recent war activities in mines, in ammunition plants, navy yards, and military camps. Believing, as Mr. Pennell does, that in the Work of a country one can find its character, and that "in our own great work of today we are only

carrying out the traditions of the great work of the past," these lithographs are a continuation of the series begun several years before the war, which Mr. Pennell has been pleased to call the Wonder of Work — the Picturesqueness of Labor. Among those earlier etchings and lithographs we recall the drawings of the bridges and sky scrapers of New York, the coal mines and oil fields of Pennsylvania, the iron and steel works of Belgium, the building of the Panama Canal, as well as the results of that laborious achievement of an earlier day — the Ancient Temples of Greece—all admirable examples of graphic art.

Here again is pictured, in the sure technique of Mr. Pennell's lithography, the colossal work of man, wonderfully portrayed, big in conception and strong in execution, illustrating the medium and subject in perfect harmony.

An exponent of labor in the field of art, Mr. Pennell shows us the present "business of nations" with vital force and realism.

Foreword & Notes

BY JOSEPH PENNELL

I HAVE never passed such an interesting —such an exciting—such a varied year in my life—and besides this, I hope I have been able to accomplish something in my work, which shall show one phase of the Wonder of the World's Work of today. I was honored a year ago by being permitted by the Rt. Hon. David Lloyd George to make drawings in the various factories and works and ship yards which were engaged in war work in England, and the records of what I saw were published as lithographs of War Work in England, a previous volume in this series. Now, though I do not believe in war, I do not see why some pictorial record of what is being done to carry on the war should not be made—made from an artist's standpoint—for we are in it, being in the world, but I am not of it.

When my work in England, or as much of it as I was allowed to do, was finished and exhibited, I was invited by the

French Minister of Munitions, M. Albert Thomas, to visit and make studies of similar subjects in that country, but, owing to a combination of unfortunate circumstances, though I went to France twice during the Summer of this year, I was unable to get anything of importance. This was my fault, or my misfortune—I failed and the memory of my failure will haunt me and be a cause of regret to me all my life—unless I am able to wipe out my failure—in another visit to France. But though I failed to make any drawings, or records of the subjects I was so freely shown, I was shown on my two visits many subjects which were supremely interesting — could I have but drawn them, they would have been worth doing. Not only was I taken to the front, but I was also taken to see some of those parts of France which have been fought over, some of the towns which have been destroyed—and some of the land which is desolate. Then I came home, for I believe the place for an American at the present time is at home. And on my arrival I was authorized to make records

similar to those I had made in England, and had failed to make in France. What I have done in the United States is shown on these walls.

I have had more opportunities of seeing what is being done in war work in England, France, and the United States than any one else—and in a fashion that no one else has been permitted to see—war in the making. Yet I did not do these drawings with an idea of helping to win the war, but because for years I have been at work—from my earliest drawings—trying to record the Wonder of Work—and work never was so wonderful as it is today. And never had any one such facilities—such aid, such encouragement given him to record its wonder—and by the Governments of the three great countries which are engaged in this incredibly horrible, absolutely unnecessary war.

Not only have I seen the Wonder of Work in these three lands—but before the war I saw it in Belgium, Germany and Italy. I have drawn it everywhere, save in Luxemburg, and there too I have seen it—but made no drawings—for it was so

easy to get to that land—and so that country was put off for a more convenient season—a season which I fear will never come again. I am not going to make comparisons—but I am going to say that the Wonder of Works is more wonderful in the United States than anywhere else in the world today. True, we are not working with that unbelievable energy which the French and English—yes, the English—have put at last into their work—but we do so much more—with so much less appearance of work—we are working for the Allies—but they are not working for us. And we are doing for them what they cannot do for themselves. In Europe the war worker works all day and every day in the year. Here most of the great industrial works have only added war work to their peace work. In Europe scarce anything else but war work is being done.

But just as the greatest human energy has been given to war work, given to make things for man to explode, to kill, to destroy; so the greatest machines have been turned to do this work with the

greatest skill and accuracy and the greatest speed—the workers are but a necessary detail—and it is the working of the great machinery in the great mills which I find so inspiring—so impressive—for the mills are shrines of war—though the churches now try to rival them. But the mills are the modern temples and in them and not in the churches do the people worship. And if only the engines turned out more engines of peace—how much better would the world be—but everything made in a war factory is made to destroy and to be destroyed. But one must not think of that; for if one did the war would stop, and not every one wants it to stop—or it would stop. But war work in America is the most wonderful work in the world and that is the reason why I have drawn some of the work I seen—seen in these endless looms of time, where history is being woven.

I want to thank the Secretaries of the Navy and of War—Messrs. Daniels and Baker, Mr. Creel, and the other members of the board and staff of the Committee on Public Information; and the

various heads of the various sub-departments of the Army and Navy, who stood my pestering and querying and obtained for me permission to visit every industrial establishment I wanted. Every plant, camp, yard, works, field, which I wanted to work in—I was taken and treated with a courtesy which I shall never forget. I should like to thank and mention by name the various officials, government and civilian, who gave me every facility to see and to draw everything I wished—but we are at war, and I am not permitted to say where these drawings were made; and if I mentioned the names of some of the directors of these works the places in which I made the drawings would be known. As it is, I imagine many of them are pretty well known already. And finally I wish to thank above all the man who made it all possible. He knows—and I know—I shall never be able to repay him—he is working and I am trying to work for our country—Dr. Frederick Paul Keppel.

JOSEPH PENNELL

LITHOGRAPHS BY JOSEPH PENNELL

BRITISH SERIES

1 The Iron Mine

Away off in the hills, but near the sea, is this great gulf fixed—a great gash— and in this is the mine, like the open mines of America, though no longer worked. But all around and about are others working, from which ore is taken, while all the hills are crowned by shafts, today bringing up more ore than ever before.

2 The Coal Mines

Up above the new munition town, seen amid the smoke, is the old colliery town, and above that the shafts of the mines. As I drew, a corporal's guard came upon me. Had I my papers? It was in a prohibited area. "I never dare to stir without them—I sleep with them. And what credentials have you?" "Only them dirty rags," said he, pointing to his uniform.

3 In the Land of Iron and Steel

A land of mist and mystery in the morning, of glitter and glare at noon, of fire and fury at night. For work never ceases in the Land of Iron and Steel. The furnaces stand in long rows on each side, a mighty avenue lined with

towers and castles; beyond, the river of work; and beyond that, more work castles and work palaces.

4 Making Pig Iron: the Base of the Blast Furnaces

Across the great work avenue, half filled with plots, not of flowers but patterns of cooling metal, are other furnaces seen amid rising smoke and steam.

5 From the Tops of the Furnaces

A subject like one seen from the top of a skyscraper—only that is soundless, this is endless sound. From the skycraper you look down on little dots of men; here on trains and cranes. And as you look a charge is emptied into the furnace—and a whole place bursts into flame, trembles, roars, then sighs and dies away. Always down below the little figures wheel barrows and push carts. And one day as I talked to a foreman, a lady workman in pants, who must have been the champion of her hockey club, came up, set down her barrow, and said: "Mr. Superintendent, a boy has been grossly rude to me. What shall I do?" "Why, Laidee, 'it 'im over the 'ed with 'af a brick out cher barrer." And she went her way.

6 The Big Gate of the Big Shop

Though the proportions might be better, this simple dignified entrance to the Work Temple is a fine as though it were covered with carv-

ing, and the feeling of mystery within as great as when the cathedral doors open at the end of mass.

And though there was no music, there came forth the endless roaring of the Looms of War. Instead of acolytes were workmen, and in solemn procession the great ladles filled with fire moved to and fro, and the great cranes stalked about; their drivers popes under their umbrellas.

7 The Great Tower: Pig Iron

From the blast furnaces the iron is brought to this yard, and carried by the cranes to the floor where I sat, to be seized by the great tongs and jaws, which were moving about behind me, and thrust into the furnaces and turned into steel —a flaming, roaring cavern, so bright that the furnace men wore colored goggles, so hot they buried themselves in their buttoned-up coats. It was not a pleasant place to work in.

8 Within the Furnaces

After the pig iron is melted in the long rows of furnaces, they are tapped, and the liquid fire runs into the great ladles; and then the great cranes, with their two great claws, pick up the ladles and carry them off, and pour the molten metal into crucibles, where it cools into ingots.

9 The Cauldrons

Another type of furnace, another system, for all these furnaces, all these works, have char-

acter—a character as distinct as in any other form of great art, for great work is great art.

10 The Perambulator

From beneath a fiery floor—from a fiery furnace—this monster drags the glowing ingots and carries them off to other furnaces, or presses, or rolling mills, or hammers, and the workmen tell you, as the policemen do in America, "Mind your step; safety first."

11 The Great Hammer

The hammers forge and stamp and press the ingots into any shape the forge men wish.

12 In the Jaws of Death: Rolling Bars for Shells

From these jagged teeth the fiery serpent snorts, shrieking and squirming, vomiting sparks—it was an ingot just before—only to be drawn back again and again, longer and thinner, cast out in heat and noise infernal. Then it crawls away to cool in long bars, or be cut into ingots by the guillotine.

13 Steel Bars for Shells

The white-hot bars, escaping from the jaws, writhe and twist about, raising in agony their fiery heads, and then either climb a long incline

into the light or squirm down into dark pits. Then they come out into a great shed or a great yard, and there they lie awhile to cool, till they are again seized by cranes or moving platforms and brought to the guillotine, which cuts them into the lengths for shells.

14 The Presses

Before the press its master stands; a white-hot ingot is put in, the press comes down, and in a moment it is the body of a shell. The master seizes it with his tongs, standing black against the burst of steam; he whirls it round, and two men take it in their tongs and carry it off red hot to the branders.

15 The Urns: Casting Big Shells

In the heart of the big shop the big ladle, full of molten metal, fills the urns; then they are dragged out and carried away to be "bottled."

16 "Bottling the Big Shell"

This shop was an old factory where a big press had been set up. The walls had all been whitewashed, and against them the press and the figures told stunningly. The afternoon I saw the bottling—the first time the big shells were bottled—the crane which was to carry them from the furnace to the press was not ready, and the work was done by men, but they made a far finer composition, for in these works it is sel-

dom you see " the man power." The machines do all, and are more human than the men who manage them.

17 Munition Works

I have no idea how many of these workscapes I have drawn, etched, lithographed, painted. I am told I should not do so many; I "spoilt the market." But I shall draw them wherever and whenever I find them—or, rather, find that they appeal to me. Whoever criticized an Old Master for his thousands of sketches and drawings? The trouble is that most painters today are so lazy or so stupid they do not see and can not do the wonderful things around them and blame and criticize the few artists who can and do.

And how much finer are the lines of chimneys than the lines of trees, while the slowly rising smoke gives the sky a beauty it never had before.

18 The Shell Factory

I have drawn one of the shell factories that have grown up all over the country within the last year. It is wonderful to see these girls planing, grinding, polishing the shells; it fascinates, but is intolerable; it is horrible, when you think that all this is done to kill people. But you must not think; if you do you will go mad. The world is mad today.

19 Finishing Shells

Larger shells being finished.

20 Evening in the Munitions Country

As I came back one evening from a hunt on the top of a trolley or tram for subjects, having found nothing, I found this. On one side the near shell factories glowing with blue-white light; on the other the far-away furnaces bathed in fire; in the foreground the quiet canal and the noisy train, the twinkling signals below, and into the calm heavens the smoky incense of war slowly rising.

21 The Bay of the Thousand Girls

One of nine or ten bays and other rooms besides, in this huge factory, the site of which they tell you was fields a few months ago. There was scarce a man about the place—only those setting up and adjusting machines. The women were doing everything, as I have tried to show. And one of the foremen said I showed too much.

"Now you've drawered 'em 'uggin' 'emselfs; now I've told 'em they wasn't to 'ug theirselfs, and you've gone and done 'em a-doin' it." Well, they were," said I.

22 Planing Big Shells

This was an old, disused shop, with great brick walls and small skylights and few windows, but it had been taken over as a munition works, the walls whitewashed, and new machinery set up, and against the white walls the lathes and planes and cranes stood out. When I was there

it was being fitted up, and the engineers told me, too, how fine it was at night, but I did not see it.

23 Munition Town

All over the country these munition mushroom towns are springing up; usually they are dumped down all over the plains; this one climbed and covered the hillside, and so was picturesque—the others are pitiful. A little more money would have made them as decent as the workmen's dwellings at Panama; but that was not spent, and they are the most depressing human huts I have ever seen.

24 The Acolytes Preparing the Altar of the War God.

No cathedral is more impressive, no altar finer; but instead of decking it with flowers, the men were making it ready to roll more armor plate. This drawing it but another proof that great work is great art, and that art today is joined to science—not religion; but the effect is just as fine.

25 Making Armor Plate

I never had the chance to see a big plate rolled, but probably this little one was just as good. The hot metal was covered with brushwood, to burn off the cooling scale, which is like a beautiful patina upon it; and the brushwood blazed in the dark shop to the roof; while, as

in all great work, only two or three men were about, the one who signalled in the foreground, the one who ran the mill and controlled it's rolls, standing like a statue over all.

26 The Old Shipyard

The Admiralty would not let me draw the naval shipyards, but here were merchant ships being built. I have never seen anything like these cranes nor the way they started to build the ships out of doors anywhere, and the ships just grew, and the cranes came and helped to build them.

27 Munitions River

The most amazing subject of all; but I was only allowed to get glimpses of it, not to go upon it, though once, when I was arrested, I was taken for a cruise on it in the hope of finding a chief constable whose existence I did not know of and to whom none of the six other local, national, county, military, munitions, and war officials, whose consent I had obtained, referred me. However, it ended all right.

28 The Gantry

A merchant shipyard. The gantry was more like those I have seen in Germany. If I had only been allowed to draw the naval yards I saw I could have made this series complete, and no secrets would have been given away, but a record would have been made.

29 The Gun Forge

When the solid metal has been roughly shaped in the furnace and press, it is again heated; and then the great chain carries it to the forge, and this monster crushes, forges, and molds it into shape—the shape of a gun.

30 The Gun Shop

When the guns are forged, either whole or in part, they are brought into the gun shop, bored and planed. They come in silently, high in air, and then are lowered in place, lie in rows, in piles, in masses, waiting their turn to be finished.

31 Cutting and Turning a Big Gun

All the week I was in this shop the big gun stood there on a great trestle, and all the while the great lathe or plane kept turning and turning at the end of it; once in a while a man would look at it or do something to it or pick up steel shavings, but all the while the machine kept turning and all the while nothing seemed to happen, but I suppose it did; it was all silent, ceaseless force.

32 The Basilica of War

Here was another big gun-planing shop, built on the same lines as a religious shop—why call

it anything else? Only instead of shrines and side altars were lathes and planes; only at the far end instead of a reredos were the wheels of war; instead of cardinals' hats, chains hung from the roof.

33 The Old Gun Pit

At one period of their creation the guns are given an oil bath; the crane seizes them, lifts them, and then lowers them into the strange-shaped towers where they are heated; then it raises them again, and drops them into an oil bath, where they are left to harden and cool.

34 The New Gun Pit

The new pits are like the old, only they are in a great hall, and instead of monstrous forms, there are marvellous effects—suggestions in mighty, lofty vagueness.

35 Bring in the Gun

On one side was the river, on the other "the bank," between the glass and iron palace, where the great turret was being built. And as I drew, and wanted something to show the might and the height of the building, the engine dragged in a gun to be fitted in the turret and my subject was before me.

36 Building the Great Turret

Story above story, all glass and iron, rises the shop where the great turrets are built, and below the floor in deep pits their bases stand. This is the other end of the shop in the previous picture. What struck me most, however, was that the open part of the turret made a design —the Pediment of War and Labor. Here was the Greek idea carried out by British workmen, and no British artist has ever seen it. But from something of this sort in Greece, Greek artists got their scheme of decoration when they were building the earliest temples.

37 Fitting Guns in Turrets

I saw these smaller guns being fitted in a turret in another shop. They are put in and then the turret is tried. When I saw it, however, the whole floor was covered with parts; it was like a watchmaker's table magnified a million times. The parts were all behind me, and the authorities did not seem to want me to draw them. This is the same subject that I found at Essen, but so different.

38 The Shops at Night: Changing Shifts

Black was the bridge, black the crowd crossing it, black the crowded trams, the blue-white light glowed from the ever-working shops, and the lights upon the cranes by the river side, on the railroad tracks suggested the workscape by their ever winking, twinkling lines and groups and dots and masses of lamps.

39 Ready for War

The mounted howitzer was getting its finishing touches; it had been tested, and soon the great doors would open, the engine puff in, carry it off on its long journey to the front, to do its infernal work—a triumph of misdirected energy and skill—for "War is Hell."

40 Taking the Big Gun Away

When this big gun had been fitted and worked in its turret, it was again taken out, carried to the river side, and between them the four cranes put it on a barge and that carried it off to the ship or its carriage.

41 Five O'clock

With the first note of the buzzer, out the workpeople come—a solid mass; you fly from thousands and thousands of them; and when they have gone another mass swarms in, for the work never stops, the mills never rest; and every eight hours the same thing happens.

42 Made in Germany: the Great Crane

I knew it; I had drawn the twin brother of this monster two years before in the docks at Hamburg, and when I asked the engineer if it was not so, he said it was, and also pointed

out how the smaller cranes put up previously showed the growth of the Wonder of Work.

43 Gun Testing

They took me to the testing ground, but on a day when there was no testing, for they told me I should have to go into a bomb-proof cellar, put stoppers in my ears, and keep my mouth open, and even then would see nothing, and that there was nothing anyway but a puff of vapor to see. So I went when they were getting the gun ready and made the drawing.

44 Munitions City

How wonderful is all this energy, this smoke, this color! How the city, set upon its hills, reveals and conceals itself! Yet its frown is terrible. Lately I read an art book which contained a few lines of description of these cities and the country where they are, for in order to show "the terror" of the land the author wrote of "the black smirched valleys," "the gloomy sky" under which "the train darted through forests of smoking chimney stacks" and over grimy, trough-like streets. That these might be wonderful, pictorial, never occurred to him.

45 By-Products

The new sort of coke ovens are the most pictorial subjects I saw—when they are at work—

because they are all effect, all bathed and wrapped in fume and steam and smoke; and these make for me and give to me my motives, though there is great work behind them.

46 Peace and War

What would Ruskin have said to this? The beautiful old abbey, built in, surrounded by, yet still dominating the munition factories? What would he have said to the aeroplane, noisly soaring over it? I neither know nor care. I only known it was a fine composition as I saw it that morning, and so I drew it.

47 The Balloon Shed

Around and about, all over the plain, the birds and bugs lie at rest, their wings making wonderful lines against the sky, wonderful colors on the grass. Then they stir and hum, and skim over the ground, and roar, and rise into the air, and sail away, and only the huge empty shed remains, and the long box on a lorry which, too, is leaving, with the sign on it: "Mesopotamia via Cardiff," whither another air machine is being shipped.

48 The Big Bug

Horrible and awful it stood in its lair, ready to be started on its voyage of destruction.

49 Shot

This is what I see every night out of my window—have seen for two years and some months, and would give anything never to see again.
Yet Wells say it—the drawing of the shot tower—is the only commonplace subject among them all.

50 The Transports

The spoils of war, for what had been great traders were now to be great troop ships—and with their transformation what an awful change has come to our world.

51 The Little Men of the Big Hammer

One seated on high worked the hammer, fast or slow, light or heavy were its blows, as he wished. Two beneath turned the big shell, as it lay in its bed between and was pounded into shape, and every time the hammer fell a pillar of fire and a cloud of steam arose, and through all and over all were the crane men in their pulpits whistling and shouting and signaling, moving back and forth, silhouetted against the lights, lost in the shadows. And in this shop as red hot shells flew about or rolled about singly or by dozens, one said to me, "Now then, Cap, in this here shop, yer jes got ter look six ways for Sunday, that there crane man's all right. but might forget yuse was under, and if that claw give yer a pat why yuse ud have a week off in the horspittle."

52 Building the Battleship

Inside the huge shed where she was built and launched, she lay again, getting her finishing

touches—or rather those that could be given her; her masts were too big to finish, her turrets were being fitted, and her turbines put in —and soon she would begin her life of terror and horror.

53 Making Propeller Blades

Blue in the shadows, and such blue—gold in the light, and such gold—were those blades—in this great shop—and as I worked, the engine steamed in and carried one off to fit in the ship standing in the dock just outside.

54 Under the Shed

It seemed as though this yard was built for me, and if it was not that I found it so practical, I should have thought it only pictorial.
But in the shed in rows, in piles, in layers, lay every part of the ship ready to fit together, all in order; as I drew, boats and boilers came out of the shop and went to their places on board.

55 The Keel

The shipyards are endless and their forms are endless and ever new—but I never before found one where from the water I could look down in the ship as it grew, as it did here, amid its forests, its walls, which the ship in turn would soon tower over.

56 Unloading Ore

When the great ore boats arrive "somewhere," they draw up at a crane covered dock and almost as fast as they are loaded they are emptied —and the ore is in the furnaces and they steam away.

57 Building Submarine Chasers

All around the big ship the little boats grew and gathered—being built out of doors, anywhere near the water into which the crane swung them as soon as they were finished, and it is like this they are being built all over the country.

58 In the Land of Brobdingnag: The Armor-Plate Bending Press

Only Swift ever imagined and Gulliver ever saw presses and ladles and chains and cranes like these; but I have seen them, and there is no imagination in my study of the press or the ladle. A press so powerful it will slowly bend the thickest plate! A ladle so big the men were lost in it!

59 In the Dry Dock

These are the things that tower—that shine—whose power is terrible—but their smile does not make glad.
The officer said he could not see the ship like

that. "Don't you wish you could," was the only answer I could think of.

60 The Armor-Plate Press

The English maker rolls rapidly his armor plate in heat and smoke and flame. The American slowly presses it, but with a press so powerful it will crush the huge ingot, so sensitive that it will not break a watch crystal placed under it.

61 The Ants

She came into the dry dock "at an Atlantic port." The water was pumped out, ropes were dropped over the side, and when the water was out, men at the bottom of the locks fastened planks to the ropes, and the crew with buckets of paint and brushes long, little, short, and big swarmed over the sides, and fell with the paint upon the ship, and while I stared and tried to draw, she was painted, both sides of her, and her propellers were polished like gold, by the ants—only ants don't work like that, only American sailors, and a few weeks before many of them had never seen a big ship.

62 The Prow

"Very pretty drawing," said the Admiral, when I showed him this leering, staring, slobbering monster, the spirit of war, a creation of our time and our country. It fascinates and is untellable.

63 The Birds of War

Like birds, and they are birds, the planes chase each other around the field; now they soar, then they dive, in the sun they glitter, in the shadows they disappear, and far and near, high and low, they rise, they soar, they plunge, and then they skim, feeling for the ground; and then they come to rest upon it—the Birds of War.

64 The White and the Black Hammers

"The biggest hammer in the world," said the foreman — maybe — anyway the shop was amongst the most pictorial of all those I have drawn devoted to shell-making.
"Say, friend," said the workman, "won't they let yer use a machine in war time; is that why youse does it by hand?"

65 Forging Shells: The Slaves of the Wheel

No composition could be finer, no movement more expressive, no grouping more perfect; and yet all this was happening every day, and all day, in an oily, dirty, greasy, smoky shell factory, where no artist had ever worked before, and the workmen, black men, were merely turning the big shell, under the big hammer, by the big capstan wheel that held it. And I noted in the shop that the black men saw more in my drawings than the white; yet there's only one black painter in the country, so far as I know.

66 The Larks

"Hark, hark, the lark"; this one sings a song, too, all his own, as he soars up to greet the coming sun; then away to battle, or to train for it. Our lark!

67 The Boat Builders

"I am jus' real proud of this hull shop; I'm jus' certain jack proud of it," said the foreman. And what could be more graceful than the lines of these wooden boats he was building—all the boats of battleships seem made of wood—and how beautiful are their lines, the result of tradition. The boat builder is no cubist, as he worked out his drawings on the floor of the shop; and so the result is strength and beauty.

68 The Riveters

What perpendicular cathedral is as full of mystery as this shop? I know of none, and I know most of them; and when the fires glow on the work altar, and the great jaws pierce and rivet the boiler plates it resounds with the Hymn of Labor.

69 The Gun Pit, No. 1

These pits, which I have drawn in Europe and America, have the greatest individuality of all the processes of war industry. The buildings

are most impressive, towering, windowless, somber without, mysterious within, filled with strong shadows and strange shapes.

And as I looked out from the blackness to the ore crane, making new ranges of Alps on its hillside, I wanted a gun to draw—or rather wanted to know how it was moved.

"Why, bring him one," said the manager—and it came, 60 feet long, and posed while I drew, and was such a good "sitter." And so I find my studio and my models wherever I work, but not often a model who poses so well and so quietly.

70 The Old Hangar

All the inventor's past life hung from the roof, successes and failures, trials and tribulations—and this old hangar like an old barn was worth drawing. Doubtless the new hangars are better suited to their purpose but they are most unpicturesque and so will all the world be, too, before long. What could be more unpicturesque than the modern soldier—more ridiculous than the modern sailor, or the modern camp?

71 Making Rifles

Gallery after gallery is like this in the great building, all filled with tiny men working at tiny machines to make the tiny guns they fight with, and over them hangs the flag of the country, put there, the director told me, not by the management but by the men.

72 Hydroplanes: At Rest on the Beach

Why do they remind one of Greek warriors with their proud helmets? I do not know, but they do. I suppose—in fact it is—because the line of the rudder is that of the crest of a helmet. Did the aeroplane builder steal, borrow, invent it? I once invented out of my head and a honeysuckle another phase of Greek art, but fio one would believe me when I said so.

73 The Embarkation Camp: The Classic Grove

No, this is not Italy but America. Another proof that the classical, the romantic landscape is all about—only if it had not been that the Embarkation Camp was by this grove I never should have seen it.

74 Building the Camp

All sorts and conditions of machines and of men were at work on it. The steam shovels removing mountains, gutters being dug as big as trenches, buildings going up and trees coming down as far as one could see—and further—the ideal of the man who said to me, as he looked over the tree-falling, town-rising landscape, "Gosh, it's fine. I am a carpenter here, but I never did no carpentering, 'cept I once did help the carpenters to build a house with my pocketbook; but now I am getting six dollars a day and, well, as it looks like a shower, I guess I won't pay the doctor ten dollars to cure a cold." So we came away in a "jitney."

75 The Camp: The New Architecture

In the center of the new city is something like a long train of box cars—yet when you see their sides you find they are houses. As you look they grow, and from a few holes in the ground till the building is finished takes about forty-five minutes. They are better built than the English munition towns—but they are unbelievable—these cities of fifty thousand inhabitants built while the army was formed. This drawing is but a bit—to right and to left and behind the town stretched—the embodiment of usefulness, respectability—a triumph of ugliness.

76 Launching the Hydroplanes: Putting Out to Sea

Somewhere at an aviation post, every morning early, the aeroplanes start seaward, pushed and coaxed and pulled along like a stubborn mule —and about as beautiful—once they are up and away. After splashing and floundering clumsily, how calm, how graceful, how serene they are as they move in and out amid the clouds in sunlight and shadow, over the summer ship-decked sea.

77 Aeroplanes: At Rest on the Plain

Why again is there such a swing and lift about these lines—because they are right and strong lines—and, when the machines stand about, how

like they are to great clumsy birds—and when they try to start they are, too; but once they have started how beautiful they are.

78 The Balloon Shed

I know of only this one "balloon shed" in the country—probably in design it is out of date, pictorially it is fine.

79 Building Destroyers, No. 1

Amid the great ways the little destroyers are built. While the work of building is going on, there seem to be no workmen about, though the noise they make is terrible. The various parts of the ships lie about apparently in confusion, but the crane knows what it wants and where to find it and picks it up and carries it to its proper place. It is only when the men knock off that you see what an army is engaged in shipbuilding. And it was too funny to be told as I went about I could not smoke, yet hundreds of drills and riveters are shedding showers of sparks and there is nothing but iron about.

80 Battle-ship Coming Home

81 The Biggest Lathe in the World

Many of the subjects I have chosen are probably the "biggest in the world" and the most

impressive, too; that is the reason why I have drawn them. I have seen great lathes and great guns in Europe, but this one is certainly greater than any other.

"You couldn't do that, Fatty," said the man. "Couldn't I," said the other. "You bet I could if I had been at it as long as him." It was the second lathe I had drawn.

82 Oil Refinery

83 The Forges

How fine are the effects—but one man said as I drew the figure leaning back to rest—"Hully gee! He's got Creeper all right. Look at his pants!" But the noise is awful and one day as I sat on a bit of boiler, a racket ten times worse than ever before broke out beneath me and I jumped right off and from the boiler crawled a grimy human, who, putting his hand to his mouth, yelled "What yer making all that racket fur?"

84 Shaping a Gun From an Ingot

When the ingot comes from the furnace, it is put in this press, deep burned in a pit, and the hot metal is compressed into the shape of a section of a great gun—then it is taken out and bored and planed and finally after about a year of work, the gun is ready to do its work.

85 The Collier

This is a freighter and collier and the huge erections on its deck are cranes, and derricks, by which other ships are coaled and loaded at sea. The system is not new, but I imagine many landsmen, like myself, have never seen such a creature.

86 The Shell Factory, No. 1

When I got there I showed my Government letter. "Umph" said the guard—and the sentinel with his gun was behind him—"You jus' don' come in here ole man on that pass—Gover'ment! The boss is the Gover'ment—I'm the ajertant!—This here's the lootenant! The Lor' Gawd Amity won't pass in on that pass!" But the next time I came the guard presented arms. And it's in this wonderful shop that the shells are made for the allies and ourselves.

87 The Shell Factory, No. 2: From Shop to Shop

The contrast between the dark old shop and bright new one was wonderful.

"Pretty good, Dad," said a precocious apprentice. I suppose they don't mean anything but compliments, still I never fail to lose my temper, then the peacemaker appears—"Don't mind that kid, mate, he dunno no better—he's edurkated." "Say, wot paper's it comin' out in? I'll buy that paper." That was a compliment.

88 The Gun Factory

So like a British one that I wonder which one got the idea of arrangement of the shop from the other. Here the guns are turned; and one man said to me: "Well, I don't know whether I'll be drafted by the U. S., but I do know I'd sooner waste my time makin' guns, than spend it hearin' 'em shot at me by some Dutchman."

89 Ready to Start

Dignified, solemn, immense she stood, held to the dock by the great cables; and the great cranes swung great carloads of war work abroad her, as fast as the engines could bring them.

On land she was guarded by marines. In the air the planes were protecting her.

90 Ready For Service Again

Just as retired officers have offered their services again to the country—so these old ships, even more pictorial than the new, are being found places where they can do their "bit."

91 The Old and the New

Whether the old wooden ship is finer in line than the new steel monster is more than I can decide, but I do know that both are well worth drawing.

92 Submarines in Dry Dock

There they lay in long lines—soon to be ready to start on their venturesome voyages.

93 Building Destroyers, No. 2

How the cranes minister to the ships, carrying them the things they want, lowering them gently into the places where they belong, and then hovering over the vessels they are building to see that everything is in its proper place—the cranes do it all—the men who run them are mere details.

94 Casting Shells

Slowly the ladle moves, carried by the crane man, steered by the workmen, goggled and gloved—I had no time to draw those details. Into each mold it dropped just enough molten metal to make a shell head. And when all the molds were filled, a man from another shop dropped in—"Say, what youse up to now?" "Me—I'm makin' shells for the Kaiser" "What an' here." "Sure," and as a French inspector passed, "Aint we sending 'em to him as quick as we kin?"

95 Building Engines for the Allies

In serried lines they stood—first one for Russia, then one for France, and on the other side several for ourselves—and I said, "Why, this is Ford's ideal," for the parts came in at the sides

of the shop and the finished engine went out at the end. "Oh, yes," said the manager, "only we have been doing it twenty years." And now they build a locomotive in four days.

96 Making War Locomotives

Big and little, they are being turned out for work in Europe and work at home. War work —and I could not forget that I had seen the same sort of work—on the same sorts of locomotives being done on the Isthmus, only that was for peace, that the locomotives should help to build the Panama Canal, as they did—build the great thing of modern times—a work by which the engineers of this country will be remembered and their memory blessed.

97 The Flying Locomotive

Yes, locomotives can soar—can fly—and, like Mahomet's coffin, stand in the air; and they do these things in a blaze of glory, because the shop where they are built is not big enough to shift them about in any other way. As the engine sailed toward me I tried to make a note of it. "Why would you like to draw it," said the manager, as I frantically went on making notes of the approaching monster. "Which end would you like up?" He made a signal (they don't talk in the shops); it stopped and there it hung. "Bring on another," signaled the manager; and so I drew and so the creature posed 'till I had finished—an excellent model in a wonderful studio.

98 Gun Pit, No. 2

No better proof could be shown of the way each big plant puts big character into its products than this and the previous drawing. Here everything is done deep down under ground; in the other shop it is all above, away up high in the air. And one day, they told me, the president of the company passed with a party, and he saw a man, tired out, sitting with his head in his hands. "Why don't you clean out the pit, boy?" "Well, Sammie, if you want to know why, you go down an' find out for yourself.

99 The Gun-Testing Ground

Into the rocky cliff great holes had been bored, and the guns mounted on their carriages by the great gantry were fired, passing through wires mounted on screens to test their velocity. One thing that interested me, standing behind the guns —interested me too much, really—was that there was no smoke, save that which came out of the hole where the shell exploded. And another fact was, that I could not see the shell in its flight, nor can those at whom it is fired—it goes so fast the sound can not keep up with it and sight can not note it.

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